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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,551	09/02/2005	Mark Alexander Dodd	GPAL PAU.57	3990
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EXAMINER BRINEY III, WALTER F				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/528,551

Applicant(s)

DODD, MARK ALEXANDER

Examiner

WALTER F. BRINEY III

Art Unit

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 and 32-41 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-30 and 32-41 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 21 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB08)
Paper No(s)/Mail Date 06/21/2008
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

- 5 A person shall be entitled to a patent unless –
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
1. **Claims 1-17, 19-23, 25, 27-30 and 32-41 are rejected under 35 U.S.C. 102(b)**
- 10 **as being anticipated by US Patent Application Publication 2003/0133587 A1**
 (filed 16 January 2002) (“Hyre”).

As an initial matter, because the claims depending from this claim define so many differing embodiments of a single inventive concept, and because *Hyre* likewise discloses a correspondingly large number of embodiments, references to the embodiments

15 disclosed by *Hyre* at figs. 3-9, and 12-17 should be read as broadly as possible. Thus, in the following analyses of the claims, references made to a single embodiment of *Hyre* should be considered as embodying references to all the embodiments of *Hyre* unless a particular embodiment includes elements mutually exclusive to the claimed invention.

Where appropriate, the Examiner will attempt to indicate when references should be read

20 broadly by using the signal “e.g.” before the name of the citation document. In all other instances, the omission of that signal will indicate the intent to draw Applicant’s attention to a specific embodiment.

Claim 1 is limited to an electromechanical drive assembly. Likewise, *Hyre* discloses an invention entitled “Speaker Driver” that comprises a speaker motor, e.g.,

Hyre at figs.3-9, including an electrical coil 6 that moves when an electrical current is applied to it because it rests in a magnetic field formed by the pole pieces defining an air gap. *See id.* at ¶ 31. The body of this claim comprises two elements and a “wherein” clause. The first element requires the following:

- 5 “a magnet structure which comprises at least one permanent magnet and is shaped to define an air gap.”

Similarly, *Hyre* discloses a speaker motor that includes a permanent magnet 32 and an air gap for receiving coil 6. *E.g., id.* at ¶ 31, figs.3-9.

The second element requires the following:

- 10 “a cylindrical coil which is received in the gap and movable axially therein relative to the magnet structure, the coil comprising at least one coil winding.”

Hyre discloses a coil 6 within the air gap 10. *E.g., id.*

The “wherein” clause requires the following:

- 15 “wherein the material and/or the shape of the magnet structure is such that the path of the magnetic flux of the permanent magnet is split.”

As evidenced by the gaps, or recesses, 10 and 12, the magnetic flux path about the opposing poles of magnet 32 splits in the region of the air gap that receives coil 6. *E.g., compare id.* at fig.3 (depicting a magnet 32 with two split poles, divided by gap 12) *with* Specification at fig.5 (also depicting a central magnet 51 with two split poles 56a and
20 56c). Therefore, *Hyre* anticipates all limitations of the claim.

Claim 2 is limited to the assembly according to claim 1. This claim requires the following:

- 25 “wherein the surfaces of the magnet structure defining the gap are shaped so that the path of the magnetic flux of the permanent magnet is split in the region of the gap.”

Hyre discloses shaping the air gap to split the magnetic flux in the gap by cutting gaps 10 and 12 into the pole pieces about the magnet 32. *E.g.*, *Hyre* at figs.3-9. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 3 is limited to the assembly according to claim 1. This claim requires the
5 following:

“wherein the material of the magnet structure defining the gap is chosen so that the path of the magnetic flux of the permanent magnet is split in the region of the gap.”

Hyre discloses filling the gaps 10 and 12 of the fig.1A embodiment with nonferrous
10 material 42 to achieve a similar flux splitting effect. *Id.* at ¶ 43, fig.17. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 4 is limited to the assembly according to claim 2. This claim requires the following:

15 “wherein the magnet structure has in at least one of its surfaces defining the air gap at least one annular recess which extends to the gap.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44. *Hyre* also discloses an air gap with a split magnetic flux in the gap, which split results from cutting gaps 10 and 12 into the pole pieces about the magnet 32. *E.g.*, *id.* at figs.3-9. Therefore, *Hyre* anticipates all limitations of the claim.

20 **Claim 5** is limited to the assembly according to claim 3. This claim requires the following:

“wherein at least one of the surfaces of the magnet structure defining the air gap is formed from a material of reduced magnetic permeability relative to the remainder of the magnet structure.”

Hyre discloses filling the gaps 10 and 12 of the fig. 1A embodiment with nonferrous material 42 to achieve a similar flux splitting effect. *Id.* at ¶ 43, fig. 17. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 6 is limited to the assembly according to claim 1. This claim requires the
5 following:

“wherein the magnet structure comprises one or more permanent magnets and one or more pieces of ferromagnetic material.”

Hyre discloses that the speaker motor includes a magnet 32 and associated pole pieces that act as ferrous magnetic conductors to complete a magnetic flux path between the
10 north and south poles of magnet 32. *E.g., id.* at ¶¶ 21, 31, 43; *see id.* at ¶ 43 (disclosing by implication that all speaker motor components aside from nonferrous elements 37, 42 are ferrous in nature.) Therefore, *Hyre* anticipates all limitations of the claim.

Claim 7 is limited to the assembly according to claim 6. This claim requires that
“the gap is defined entirely by the one or more pole pieces.” In one set of embodiments,
15 *Hyre* discloses an air gap defined entirely by pole pieces as claimed. *E.g., id.* at figs. 3-9, 13, 14, 16, 17. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 32 is limited to the assembly according to claim 7. This claim requires the following:

“wherein the one or more permanent magnets and/or the one or more pole pieces
20 are shaped to define at least one annular recess in the magnet structure which extends to and merges with the air gap.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44.

Moreover, the set of embodiments cited in claim 7 all include at least one annular recess as claimed. *E.g., id.* Therefore, *Hyre* anticipates all limitations of the claim.

Claim 34 is limited to the assembly according to claim 32. This claim requires the following:

“wherein the one or more pole pieces are shaped so that the at least one recess extends from the air gap to the permanent magnet.”

- 5 The set of embodiment cited in claim 32 all include annular recesses that extend from the gap back towards the centerline of the speaker, which also means towards a permanent magnet 32, 36 located towards the center of the speaker. *E.g., id.* Therefore, *Hyre* anticipates all limitations of the claim.

Claim 36 is limited to the assembly according to claim 7. This claim requires the following:

- 15 “wherein the magnet structure comprises at least one piece of material of reduced magnetic permeability relative to the one or more pole pieces, the at least one piece of reduced permeability material being annular in shape and extending from the air gap, where it defines a portion of the surface thereof, to the one or more permanent magnets.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44.

- Moreover, *Hyre* discloses nonferrous material 42 that extends from the gap towards the centerline of the speaker, which also means towards a permanent magnet 32, 36 located towards the center of the speaker. *Id.* at fig.17. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 8 is limited to the assembly according to claim 6. This claim requires the following:

“wherein the gap is defined in part by the one or more pole pieces and in part by the one or more permanent magnets.”

- 25 *Hyre* at fig.15 discloses a gap defined by pole pieces and nonferrous materials 37. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 33 is limited to the assembly according to claim 8. This claim requires the following:

5 “wherein the one or more permanent magnets and/or the one or more pole pieces are shaped to define at least one annular recess in the magnet structure which extends to and merges with the air gap.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44.

Moreover, *Hyre* at fig.15 discloses pole pieces, such as 37 and 38, that define gaps.

Therefore, *Hyre* anticipates all limitations of the claim.

10 **Claim 35** is limited to the assembly according to claim 33. This claim requires the following:

 “wherein the one or more pole pieces are shaped so that the at least one recess extends from the air gap to the permanent magnet.”

The gap defined by the pole piece 37 creates an air gap that reaches to and even contacts magnets 36. *Id.* at fig.15. Therefore, *Hyre* anticipates all limitations of the claim.

15 **Claim 37** is limited to the assembly according to claim 8. This claim requires the following:

20 “wherein the magnet structure comprises at least one pieces of material of reduced magnetic permeability relative to the one or more pole pieces, the at least one piece of reduced permeability material being annular in shape and extending from the air gap, where it defines a portion of the surface thereof, to the one or more permanent magnets.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44.

Moreover, *Hyre* discloses a pole piece 38 and a nonferrous material 37 with reduced permeability. *Id.* at ¶ 43, fig.15. The air gap formed by pole piece 38 and nonferrous
25 material 37 reaches to and even touches magnets 36. *Id.* Therefore, *Hyre* anticipates all limitations of the claim.

Claim 9 is limited to the assembly according to claim 6. This claim requires the following:

5 “wherein the one or more permanent magnets and/or the one or more pole pieces are shaped to define at least one annular recess in the magnet structure which extends to and merges with the air gap.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44.

Moreover, *Hyre* discloses gaps 10 and 12 that correspond to the claimed annular recesses.

E.g., id. at figs.3-9. Therefore, *Hyre* anticipates all limitations of the claim.

10 **Claim 10** is limited to the assembly according to claim 9. This claim requires the following:

 “in which the one or more pole pieces are shaped so that the at least one recess extends from the air gap to the permanent magnet.”

15 *Hyre* discloses poles with gaps 10 and 12. The gaps define recesses that extend from the air gap receiving coil 6 towards the centerline of the speaker, which also means towards a permanent magnet 32, 36 located towards the center of the speaker. *E.g., id.* at figs.3-9.

Therefore, *Hyre* anticipates all limitations of the claim.

Claim 11 is limited to the assembly according to claim 6. This claim requires the following:

20 “wherein the magnet structure comprises at least one piece of material of reduced magnetic permeability relative to the one or more pole pieces, the at least one piece of reduced permeability material being annular in shape and extending from the air gap, where it defines a portion of the surface thereof, to the one or more permanent magnets.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44.

25 Moreover, *Hyre* discloses a pole piece 38 and a nonferrous material 37 with reduced permeability. *Id.* at ¶ 43, fig.15. The air gap formed by pole piece 38 and nonferrous

material 37 reaches to and even touches magnets 36. *Id.* Therefore, *Hyre* anticipates all limitations of the claim.

Claim 12 is limited to the assembly according to claim 1. This claim requires the following:

- 5 “wherein alternate annular portions of an inner surface of the air gap are formed from the magnet structure and from a material of reduced magnetic permeability relative to the remainder of the magnet structure.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44.

- Moreover, *Hyre* discloses at ¶ 43, fig.15, an inner surface of a speaker motor having
10 nonferrous portions 37 alternating with magnets 36. *Id.* Therefore, *Hyre* anticipates all limitations of the claim.

Claim 14 is limited to the assembly according to claim 12. This claim requires the following:

- 15 “wherein the annular portions of the inner surface are aligned across the gap with the annular portions of the outer surface.”

Hyre at fig.15 depicts an alignment between the inner surface of a speaker motor and an outer surface of a speaker motor. Therefore, *Hyre* anticipates all limitations of the claim.

- Claim 19** is limited to the assembly according to claim 12. This claim requires that “there are at least two said annular portions of reduced permeability.” *Hyre* at fig.15
20 depicts two annular regions 37 of reduced permeability—i.e. nonferrous material.
Therefore, *Hyre* anticipates all limitations of the claim.

Claim 13 is limited to the assembly according to claim 1. This claim requires the following:

“wherein alternate annular portions of an outer surface of the air gap are formed from the magnet structure and from a material of reduced magnetic permeability relative to the remainder of the magnet structure.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44.

- 5 Moreover, *Hyre* discloses nonferrous materials 42 fitting in an outer surface of an air gap receiving coil 40. *Id.* at fig.17. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 38 is limited to the assembly according to claim 13. This claim requires the following:

- 10 “wherein the annular portions of the inner surfaces are aligned across the gap with the annular portions of the outer surface.”

The embodiment depicted by *Hyre* at fig.17 includes nonferrous materials 42 aligned across an air gap receiving coil 40. Therefore, *Hyre* anticipates all limitations of the claim.

- Claim 15** is limited to the assembly according to claim 1. This claim requires the following:

“wherein the surface of the magnet structure defining an inner surface of the air gap is shaped so that the inner surface of the air gap is interrupted by a plurality of annular recesses which extend to and merge with the gap.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44.

- 20 Moreover, the embodiments depicted by *Hyre* at figs.13, 15 include an air gap including a plurality of recesses just as claimed. Therefore, *Hyre* anticipates all limitations of the claim.

- Claim 17** is limited to the assembly according to claim 15. This claim requires that “the inner annular recesses are aligned across the gap with the outer annular recesses.” The embodiments depicted by *Hyre* at figs.13, 15 include recesses in the inner

wall of an air gap receiving coil 40 and recesses in the outer wall, where the inner and outer recesses are aligned. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 20 is limited to the assembly according to claim 15. This claim requires the following:

- 5 “wherein there are at least four said annular recesses extending to and merging with the air gap.”

Hyre discloses in two embodiments four recesses as claimed, where two recesses exist in both the inner and outer surface of an air gap receiving a coil 40. *Id.* at figs.13, 14.

Therefore, *Hyre* anticipates all limitations of the claim.

- 10 **Claim 40** is limited to the assembly according to claim 15. This claim requires the following:

 “wherein there are at least two said annular recesses in each cylindrical wall of the air gap.”

The embodiments depicted at figs.13, 15 of *Hyre* show at least two recesses. Therefore,

- 15 *Hyre* anticipates all limitations of the claim.

Claim 16 is limited to the assembly according to claim 1. This claim requires the following:

- 20 “wherein the surface of the magnet structure defining an outer surface of the air gap is shaped so that the outer surface of the air gap is interrupted by a plurality of annular recesses which extend to and merge with the gap.”

Hyre discloses that the loudspeaker and all of its elements are annular. *Id.* at ¶ 44.

Moreover, the embodiments depicted by *Hyre* at figs.13, 15 include an air gap including a plurality of recesses just as claimed. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 39 is limited to the assembly according to claim 16. This claim requires the following:

“wherein the inner annular recesses are aligned across the gap with the outer annular recesses.”

- 5 The embodiments depicted by *Hyre* at figs.13, 15 include recesses in the inner wall of an air gap receiving coil 40 and recesses in the outer wall, where the inner and outer recesses are aligned. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 41 is limited to the assembly according to claim 16. This claim requires the following:

- 10 “wherein there are at least four said annular recesses extending to and merging with the air gap.”

Hyre discloses in two embodiments four recesses as claimed, where two recesses exist in both the inner and outer surface of an air gap receiving a coil 40. *Id.* at figs.13, 14.

Therefore, *Hyre* anticipates all limitations of the claim.

- 15 **Claim 21** is limited to the assembly according to claim 1. This claim requires the following:

“wherein the coil comprises a former on which are formed two or more axially-spaced coil windings.”

- Hyre* depicts a coil 6, 40 with a plurality of windings, the windings being spaced along a vertical axis as depicted. *E.g., id.* at fig.1A. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 22 is limited to the assembly according to claim 21. This claim requires that “the axial extent of the windings is less than the axial extent of the air gap.” The windings 6, 40 of *Hyre* are also depicted within the axial extent of the air gap defined by

a top plate 34 and bottom plate 38. *E.g., id.* Therefore, *Hyre* anticipates all limitations of the claim.

Claim 23 is limited to the assembly according to claim 1. This claim requires the following:

- 5 “first and second permanent magnets which are spaced-apart in the axial direction of the air gap.”

In the embodiment depicted by *Hyre* at fig.15, two magnets 36 define the upper and lower axial extent of an air gap. Therefore, *Hyre* anticipates all limitations of the claim.

- Claim 25** is limited to the assembly according to claim 1. This claim requires that
- 10 “the magnet structure and the coil are substantially cylindrically symmetric.” *Hyre* discloses that the loudspeaker and all of its elements are cylindrical, or annular. *Id.* at ¶ 44. Therefore, *Hyre* anticipates all limitations of the claim.

- Claim 27** is limited to the assembly according to claim 1. This claim requires that
- 15 “the air gap and the coil are each cylindrical.” *Hyre* discloses that the loudspeaker and all of its elements are circular, or annular. *Id.* at ¶ 44. Therefore, *Hyre* anticipates all limitations of the claim.

- Claim 28** is limited to a magnet and coil assembly. That assembly comprises “at least one magnetic circuit which is split so as to mitigate a permeability thereof.”
- Likewise, *Hyre* discloses an invention entitled “Speaker Driver” that comprises a speaker
- 20 motor, *e.g., Hyre* at figs.3-9, including an electrical coil 6 that moves when an electrical current is applied to it because it rests in a magnetic field formed by the pole pieces defining an air gap. *See id.* at ¶¶ 21, 31. The speaker motor further includes a permanent magnet 32. *E.g., id.* As evidenced by the gaps, or recesses, 10 and 12, the magnetic flux

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path about the opposing poles of magnet 32 splits in the region of the air gap that receives coil 6. *E.g., compare id.* at fig.3 (depicting a magnet 32 with two split poles, divided by gap 12) *with* Specification at fig.5 (also depicting a central magnet 51 with two split poles 56a and 56c). According to *Hyre*, this split gap design reduces the permeability of the magnetic circuit in regions of the flux path, as evidenced by an anisotropic flux intensity in the air gap. *See id.* at ¶¶ 7, 21. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 29 is limited to a magnet and coil assembly. The assembly comprises three elements:

“one or more magnets;

one or more coils; and

one or more magnetic circuits between the one or more magnets and the one or more voice coils, at least one of the magnetic circuits being split so as to mitigate a permeability thereof.”

Likewise, *Hyre* discloses an invention entitled “Speaker Driver” that comprises a speaker motor, *e.g., Hyre* at figs.3-9, including an electrical coil 6 that moves when an electrical current is applied to it because it rests in a magnetic field formed by the pole pieces defining an air gap. *See id.* at ¶¶ 21, 31. The speaker motor further includes a permanent magnet 32. *E.g., id.* As evidenced by the gaps, or recesses, 10 and 12, the magnetic flux path about the opposing poles of magnet 32 splits in the region of the air gap that receives coil 6. *E.g., compare id.* at fig.3 (depicting a magnet 32 with two split poles, divided by gap 12) *with* Specification at fig.5 (also depicting a central magnet 51 with two split poles 56a and 56c). According to *Hyre*, this split gap design reduces the permeability of the magnetic circuit in regions of the flux path, as evidenced by an anisotropic flux intensity in the air gap. *See id.* at ¶¶ 7, 21. Therefore, *Hyre* anticipates all limitations of the claim.

Claim 30 is limited to a loudspeaker. That loudspeaker comprises "an assembly according to claim 29 and a cone which is attached to the coil." *Hyre* likewise discloses a loudspeaker that includes a diaphragm and uses one of the motors depicted at figs.3-9, 12-17. *E.g., id.* at ¶ 21. Therefore, *Hyre* anticipates all limitations of the claim.

- 5 **2. Claims 1 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent Application Publication 2003/0190052 A1 (filed 18 March 1999) ("Button").**

10 **Claim 1** is limited to an electromechanical drive assembly. The body of this claim comprises two elements and a "wherein" clause. The first element requires the following:

 "a magnet structure which comprises at least one permanent magnet and is shaped to define an air gap."

Fujihira depicts a loudspeaker with magnet M that defines an air gap. *Button* at figs.4, 6.

The second element requires the following:

- 15 "a cylindrical coil which is received in the gap and movable axially therein relative to the magnet structure, the coil comprising at least one coil winding."

Fujihira depicts a coil 10. *Id.*

The "wherein" clause requires the following:

- 20 "wherein the material and/or the shape of the magnet structure is such that the path of the magnetic flux of the permanent magnet is split."

Fujihira depicts the flux paths from the permanent magnet, through the pole pieces and back to the magnets. *Id.* As depicted, the flux through the poles splits and travels through the ring and nonferrous copper rings 16C, 16F, 16F' and returns to the magnet. Therefore, *Button* anticipates all limitations of the claim.

Claim 18 is limited to the assembly according to claim 1. This claim requires the following:

5 “wherein alternate annular portions of one of the inner and the outer surfaces of the air gap are formed from the magnet structure and from a material of reduced magnetic permeability relative to the remainder of the magnet structure and the surface of the magnet structure defining the other of the inner and the outer surface of the air gap is shaped so that the said other surface of the air gap is interrupted by a plurality of annular recesses which extend to and merge with the gap, the annular portions of reduced magnetic permeability being aligned across the gap with the annular recesses.”

10 *Button* discloses copper rings 16D, 16E across from a recess. *Id.* at ¶ 32, fig.4.

Therefore, *Button* anticipates all limitations of the claim.

3. Claims 1 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 6,542,617 B1 (filed 25 May 2000) (“Fujihira”).

15 **Claim 1** is limited to an electromechanical drive assembly. The body of this claim comprises two elements and a “wherein” clause. The first element requires the following:

“a magnet structure which comprises at least one permanent magnet and is shaped to define an air gap.”

20 *Fujihira* depicts a loudspeaker with magnets 21, 23 and 26 and air gaps 25 and 28.

Fujihira at fig.4.

The second element requires the following:

“a cylindrical coil which is received in the gap and movable axially therein relative to the magnet structure, the coil comprising at least one coil winding.”

25 *Fujihira* depicts coils 29 and 30. *Id.*

The “wherein” clause requires the following:

“wherein the material and/or the shape of the magnet structure is such that the path of the magnetic flux of the permanent magnet is split.”

Fujihira depicts the flux paths from the permanent magnets, through the pole piece 22a and back to the magnets. *Id.* As depicted, the cumulative flux through any given pole splits and returns to a magnet. Therefore, *Fujihira* anticipates all limitations of the claim.

Claim 24 is limited to the assembly according to claim 1. This claim requires the
5 following:

“first, second and third permanent magnets which are spaced-apart in the axial direction of the air gap.”

Fujihira discloses three magnets 21, 23 and 26 displaced along the axial direction of the air gap 25, 28. Therefore, *Fujihira* anticipates all limitations of the claim.

10 **4. Claims 1 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Korean Patent Application Publication 1020010089034 A (published 29 September 2001) (“Kim”).**

Claim 1 is limited to an electromechanical drive assembly. The body of this claim comprises two elements and a “wherein” clause. The first element requires the

15 following:

“a magnet structure which comprises at least one permanent magnet and is shaped to define an air gap.”

Kim likewise discloses a magnet structure with permanent magnets 4 and 5 that together with pole pieces 3, 7 and 9 define air gaps 1 and 2. *Kim* at fig.3.

20 The second element requires the following:

“a cylindrical coil which is received in the gap and movable axially therein relative to the magnet structure, the coil comprising at least one coil winding.”

Kim discloses that air gaps 1 and 2 receives cylindrical coils as claimed. *Id.* at fig. 7.

The “wherein” clause requires the following:

“wherein the material and/or the shape of the magnet structure is such that the path of the magnetic flux of the permanent magnet is split.”

Kim depicts the flux paths from the permanent magnets, through the poles and back to the magnets. *Id.* at figs.3C, 5C, 8B, 8D. As depicted, the cumulative flux through any given

5 pole splits and returns to a magnet. Therefore, *Kim* anticipates all limitations of the claim.

Claim 26 is limited to the assembly according to claim 1. This claim requires the following:

10 “wherein the magnet structure comprises a plurality of generally-conical pole pieces which are arranged about a common axis and nested within one another with air spaces therebetween [sic], the outer edges of the pole pieces defining the inner wall of the air gap.”

The various magnetic circuits depicted by *Kim* at figs.3, 5, 7-8 include a plurality of conically shaped poles arranged about a central pole axis and are nested as claimed. The
15 outer surfaces of the poles define the several air gaps of each circuit. *Id.* Therefore, *Kim* anticipates all limitations of the claim.

Conclusion

The following prior art is made of record and not relied upon, but is considered pertinent to applicant's disclosure:

- 20
- US Patent 3,867,587 (loudspeaker with anisotropic poles having alternating layers of ferrous and nonferrous materials.)
 - US Patent 4,783,824 (loudspeaker with flux splitting between two magnetic paths.)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WALTER F. BRINEY III whose telephone number is (571)272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A. Kuntz can be reached on (571) 272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Walter F. Briney III/
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Art Unit 2614

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